

d) a second external conductor made of metal or combination thereof, which is formed in cylindrical pipe and longitudinally welded, extruded or edges overlapped. The second external conductor comprises the water protective element. The water protective element comprises swellable tapes and can be placed helically, annularly or longitudinally on the conductor; and

e) the external cover which is made of medium density polyethylene which has precise ratios of antioxidant to insure best conditions against weathering, as well as protection against UV rays.

The advantages of the cable design of presently claimed invention are maximum stress without change in electrical properties, minimum bending ratio, adherence onto the dielectric and characteristic impedance. Additionally, the cable operates at a temperature between -40 to 80°C. and presents a nominal net weight of 140 Kg/Km.

The structure/layer configuration and manipulation of the different layers with various elements and components, to achieve a cable, the core conductor of which is made of copper plated aluminum wire comprising three layers, present an unobvious dry, water resistant coaxial cable over the prior art. Moreover, the external conductor is helically surrounded with a pair of blocking threads having an absorption speed of ≥ 15 ml/g/min and absorption capacity is about 30 ml/g. Finally, the method for preparing the cable, e.g., using several coextrusion and various application techniques and elements, is unobvious over the prior art.

ARGUMENTS

Applicants have presented arguments and evidence in their response to establish that the Examiner has failed to establish a *prima facie* case of obviousness. Applicants submit that the Examiner has failed to fully address and consider such arguments and evidence as directed by law.

In order to support a rejection under 35 U.S.C. §103, a basis for a suggestion to make the claimed invention must be found in the prior art. In addition, one of ordinary skill in the art would have had to have a reasonable expectation of success of making the claimed invention. It is submitted that neither of these elements are found in the art cited by the Examiner.

Applicants request the Examiner to reconsider upon review of all the evidence whether one of ordinary skill in the art would have been motivated to use an adhesive from Goehlich and that they would have been able to do so with a reasonable expectation that the cable would function effectively without significantly affecting the other components contained therein.

The Examiner urged that it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ an adhesive from Goehlich in the cable of Chan et al. and arrive at the presently claimed invention. The Examiner has not shown prior art that provides motivation or suggestion to incorporate the adhesive. Furthermore, an ability of one of ordinary skill in the art to incorporate the adhesive of Goehlich in the cable of Chan et al. does not lead the artisan to achieve the presently claimed invention because there are several factors to be considered, e.g., a) design of the cable, e.g., choice of elements or layers; b) choice of swellable materials; c) use of encapsulation jacket; or d) use of concentric neutral wires (CN).

a) Design of cable- Choice of elements or layers

Belli et al., at cols. 1-2, disclose several examples of problems in the prior art associated with water penetration as follows:

“...Cables for medium- or high-voltage power transmission or distribution generally consist of a metal conductor coated with a first inner semiconductive layer, an insulating layer and an outer semiconductive layer. For some uses, in particular when it needs to be watertight with respect to the exterior, the cable is enclosed inside a metal shield, usually an aluminium or copper shield, consisting of a continuous tube or a metal sheet shaped into a tube and welded or sealed so as to be watertight ...”

During production, *installations or use, breakages and piercings can occur in the metal shield, which allow penetration of moisture or even water into the cable core, with formation of electrochemical trees in the insulation layer, which can cause insulation failure.*

A possible solution to this problem is provided in U.S. Pat. No. 4,145,567. A high-voltage cable is described therein having, around the outside of the outer semiconductive layer, a compressible layer of a foamed plastic material which should prevent external moisture from reaching the insulation layer, thus avoiding formation of electrochemical trees. According to that disclosure, the metal shield preferably maintains some pressure against the compressible layer so that no air or other fluid can travel along the interface between the compressible layer and the metal shield. As further insurance against passage of fluid along the cable, the metal shield can be bonded to the compressible layer. The compressible layer is preferably semiconducting.

Ruptures in the metal shield may be caused by the thermal cycles to which the cable is subject as a result of the daily variations in

the intensity of the transported current, with corresponding variations in the cable temperature of between room temperature and the maximum operating temperature (for example between 20 C and 90C.). These thermal cycles *cause dilation* and subsequent contraction of the coating layers of the cable, with consequent radial forces exerted on the metal shield. The metal shield can thus suffer mechanical deformations with formation of empty spaces between the shield and the outer semiconductive layer, which may give rise to non-uniformity in the electrical field. At the utmost, these deformations can lead to rupture of the shield, particularly when it is welded or attached by means of sealing, and hence to complete loss of functionality of the shield.

A possible solution to this problem is provided in U.S. Pat. No. 5,281,757, where the metal shield is free to move with respect to the adjacent layers and has the overlapping edge portions bonded together by an adhesive which allows the overlapping edge portions to move relative to each other during the thermal cycling of the cable. A cushioning layer as that disclosed in the above-mentioned U.S. Pat. No. 4,145,567 may be applied between the metal shield and the cable core. If desired, the cushioning layer may be a water swellable tape or a water swellable powder instead of a foamed plastic material.

According to the Applicant's experience, cable designs such as those described in U.S. Pat. Nos. 4,145,567 and 5,281,757 are not completely satisfactory. Firstly, the presence of a compressible layer between metal shield and cable core as disclosed in U.S. Pat. No. 4,145,567 is not sufficient to effectively avoid penetration and propagation of moisture or water along the cable. In fact, to obtain an effective water-blocking effect, in U.S. Pat. o. 5,281,757 it is suggested to use, instead of the compressible layer, a water-swellable tape or powder.

However, the *introduction of a water-swellable material under the metal shield would cause serious electrical problems*. In fact, the metal shield, in addition to constituting a barrier against penetration of water and/or moisture, exerts important electrical functions and needs to be in electrical contact with the outer semiconductive layer. A first function of the metal shield is indeed to create a uniform radial electric field inside the cable and, simultaneously, to cancel out the electric field outside the cable. A further function is to support short-circuit currents.

Finally, cables are known in the art which are designed to attenuate the effect of the thermal cycles on the metal shield and at the same time to avoid propagation of moisture and/or water along the cable. These cable are provided with an outer semiconductive layer with V-shaped longitudinal grooves which are filled with a water-swellable material in the form of powder. The V-shaped geometry should ensure electrical contact between the semiconductive layer and the metal shield, on the one hand, and should assist the elastic recovery of the thermal dilations by the material which makes up the semiconductive layer, on the other hand.

However, producing these longitudinal grooves involves the use of a semiconductive layer of high thickness (about 2 mm or more), thereby increasing the cost and the overall weight of the cable. In addition, the desired geometry of the semiconductive layer is generally achieved by means of a precise process of extrusion in which appropriately designed dies are used. On the basis of the Applicant's experience, the formation of grooves of irregular geometry is, in practical terms, inevitable during such an extrusion process. These geometrical irregularities can give rise to a non-uniform distribution of the pressure exerted on the

metal shield and thus *prevent the semiconductive layer from correctly carrying out its function of elastic absorption of the radial forces.*

Therefore, the cables according to the above prior art cannot effectively address both the problem of avoiding penetration and propagation of moisture and/or water inside the cable core, and the problem of possible deformations or breakages of the metal shield due to the cable thermal cycles, while maintaining a proper electrical contact between metal shield and cable core...."

b) Choice of swellable materials

Chan et al., at cols. 1-2 provide as follows:

"...It is already known to use a *water swellable* material in an electrical power cable to provide a water barrier under the jacket of such cable. For example, U.S. Pat. No. 5,010,209 issued Apr. 23, 1991, discloses use of water swellable particles, namely powder, or of a filling compound with such particles or of a water swellable tape or a combination of these to provide such barrier. However, in the construction *using CN wires*, referred to as wire serving, as shown in FIGS. 6 to 8 of said U.S. Pat. No. 5,010,209, a layer of water swellable particles is always provided. The use of water swellable powder presents a number of disadvantages. When working with such powder, dust particles are spread in the air and they may cause a flash fire in the presence of a flame. Such dust may also cause respiratory problems and/or eye irritation. Moreover, surfaces subject to spills or dusting can become slippery when wet, resulting in *unsafe* work areas.

The use of a layer of water swellable tape over the length of the cable increases the overall diameter and weight of the cable which, in many instances, is undesirable. Also, the cost associated with the application of water swellable tape and powder is significant and will translate into a *higher cost* of the cable. ..."

Belli et al, at col. 2, lines 28-40 provide as follows:

"...The presence of an insulating material such as a water-swellable material under the metal shield cannot ensure electrical continuity between the cable core and the metal shield. Moreover, from the point of view of production and handling, the use of water-swellable tapes or of free water-swellable powders has many drawbacks. Particularly, the use of a water-swellable tape involves an *appreciable increase in costs and a decrease in productivity*, since these tapes are expensive and imply the addition of a wrapping stage to the cable production process. On the other hand, the presence of free-flowing water-swellable powders makes production and installation of the cable quite *cumbersome*...."

c) Use of encapsulation jacket

Chan et al., at col. 1, lines 37- 67 to col. 2, lines 1-3 provide as follows:

"...It is known that moisture ingress into the insulation can result in the formation of "water trees" which shorten cable life significantly. Water trees are diffused structures or micro-channels with a bush like or fan-like appearance. They grow from defects such as voids, contaminants and semi-conductive shield protrusions in the presence of water and an electric field. The overall protective polymeric jacket, provided over

the metallic shield, has a positive effect in minimizing tree growth. However, buried, underground distribution cables sometimes experience mechanical damage to the jacket during installation or subsequent accidental dig-ins, allowing ground water to migrate under the jacket. This almost unlimited supply of water can result in the accelerated growth of water trees in the affected section of the cable. In addition, the length of cable exposed to this *accelerated tree growth is increased* due to water migration along the longitudinal axis of the cable. Obviously, the probability of cable failure will increase as the length of the affected section increases. *One approach for limiting the affected area is to use an encapsulating jacket over the concentric neutral (CN) wires to minimize longitudinal water migration over the entire length of the installed cable. Unlike the conventional "sleeve" jacket, the encapsulating jacket is designed to fill the spaces between the concentric neutral wires. While the encapsulating jacket is an improvement over the "sleeve" jacket in terms of resistance to longitudinal water migration, it is not entirely effective in that some *water leakage* occurs along the slight grooves or indentations made by the concentric neutral wires and/or at the interface between the cable core and the jacket. The water leakage can be observed when the cable is tested in accordance with the water penetration test procedure specified in industry specifications such as International Electrotechnical Commission..."*

d) Use of Concentric Neutral wires

Chan et al., at col. 2, lines 27-41 provide as follows:

"....U.S. Pat. No. 5,146,046 issued Sep. 8, 1992 discloses the use of two water swellable strand-like members, such as yarns, wrapped in opposite helical directions between the relatively supple core wrap layer and the smooth, relatively rigid jacket of a communication cable. The major difference between the communication cable of U.S. Pat. No. 5,146,046 and the electrical power cable of the present invention is that the latter requires the use of CN wires and of a protective plastic jacket as part of the insulation shield system. The use of strand like members such as shown in U.S. Pat. No. 5,146,046, in a communication cable *without the CN wires, does not provide any indication of water blocking capability* of such strands in a power cable with a ground shield consisting of CN wires..."

As discussed above, it is an on-going goal in the art to prevent water penetration in the cable art. It is not a matter of incorporation or substitution of an element or layer. For example, Belli et al. disclose different configurations, variations and designs of cables where breakages, and piercings can occur, as well as, rupture problems. Chan et al. disclose that water swellable materials provide a number of disadvantages, e.g., cause flash fire, eye irritation or unsafe work areas. Thus, Applicants refute the Examiner's contention that it would be obvious to make substitutions or incorporations in a specific cable configuration and arrive at the Applicants' present invention. These problems in the prior art can not be solved by simple substitution without experimentation. Rather, it is

submitted that the specified claimed modifications in the presently claimed invention must be specifically motivated or suggested by the prior art.

Moreover, even if the references did indicate that such an incorporation may be tried, an “obvious-to-try” standard would be indicated, which is clearly not a sufficient basis for the rejection. The specified claimed modifications must be specifically motivated or suggested by the prior art.

Cited references

Chan et al. (U.S. 5,486,648)

Chan et al. is directed to electric power cables having CONCENTRIC NEUTRAL WIRES (CN) applied helically over the cable core as a metallic ground shield which is then protected with a protective polymeric jacket.

The configuration of the cable of Chan et al. comprises a) a cable having a core (solid or stranded conductor made of copper or aluminum); b) a semi-conductor shield layer made of semi-conductive polymeric compound such as crosslinked polyolefin (XLPE, ethylene propylene rubber (EPR) or ethylene vinyl acetate); c) an insulation layer over shield layer such as polyethylene, XLPE, EPR or the like; d) a semi-conductive insulation shield over the insulation layer and e) concentric neutral wires (CN) as metallic ground shield applied helically over cable core. The presence and several configurations of CN are required in order to prevent water penetration.

Goehlich (U.S. 6,784,371)

Goehlich (U.S. 6,784,371) is directed to power cables comprising a cable core, inner cable sheath, an outer sheath and a sensor. Goehlich has a totally different configuration as compared to the cable of the present invention. The cable contains a sensor for detecting a detectable substance such as water inside the cable. The object of Goehlich is to provide a cable which meets the requirements of *detecting* water in the interstices between the outer sheath, i.e., plastic and inner sheath, i.e. metal or plastic.

Goehlich comprises a “structured material” between the inner cable sheath and the outer sheath to allow detectable substance. The invention of Goehlich centers on “structured material”. The “structured material may include a) swellable material; b) self

adhesive; c) one or more tapes; d) sputtered tape; d) stripe shaped tape; e) sealing material.

Belli et al. (U.S.6,455,769)

Belli et al. (U.S.6,455,769) disclose electrical cables for high or medium voltage power transmission in distribution having semiconductor water blocking expanded layer.

Belli et al. is directed to a cable comprising a conductor (1), an inner semi-conductive layer (2); insulating layer(3); compact semi-conductive non-expanded layer (4); expanded layer (5); metal shield (6) and an outer sheath (7). Belli discloses the use of fillers which the presently invention avoids.

35 U.S.C. §103

I. The rejection of the claims under 35 U.S.C. § 103 should be withdrawn because there is no motivation or suggestion to combine the prior art and arrive at the claimed invention.

The Examiner has not shown prior art that provides motivation or suggestion to incorporate the adhesive of Goehlich in the cable of Chan et al. and arrive at the cable design of the presently claimed invention. In addition, the Examiner has not shown the motivation to choose/select a specific adhesive from a multitude of polymers disclosed in Goehlich.

The main objective of Chan et al. is to provide a longitudinal waterblock power cable having concentric neutral wires (CN) as a metallic ground shield. Several arrangements of incorporating the CN were disclosed in col. 3, lines 5-54. For example, 1.) the water swellable element is helically wound around the core under CN with a lay opposite to CN thereby crisscrossing the CN wires; 2) the water swellable element is wound over and under the CN wires; 3.) the swellable element is wound on the cable core under the CN with a lay opposite of CN while other element may be wound on the core parallel to the CN wires; 4) the swellable element is helically wound around each CN wire.

From the above, Chan et al. disclose a “*multitude of CN configurations and embodiments.*” Chan et al. disclose various desired combination of the different

arrangements. It is submitted that the configuration of the cable in Chan et al. is totally different from the configuration of the dry, water resistant coaxial cable of the present invention. The concentric neutral wires surround the insulation shield, semiconductive shield and conductor. Note Figure 2. Moreover, there is no disclosure or suggestion in Chan et al. regarding adhesives and other layers such as second external conductor and second conductor of the present invention.

Chan is directed to electric power cables having CN applied helically over the cable core as a metallic ground shield which is then covered by a protective polymeric jacket. The invention relates to improved protection against migration of water in such power cables by providing suitable continuous, elongated water swellable elements such as yarns, filaments, strands or strips in contact with CN and so disposed in relation to said CN wires to block the passage of water within the cable in the longitudinal direction.

Recent court opinions hold that the references must plainly or clearly suggest the combination of elements. See, for example, *King Instruments Corp. v. Otari*, 767 F.2d 853, 859 (Fed. Cir. 1989). See also *In re Grabiak*, where the Federal Circuit repeated the CCPA's statement in *In re Bergel and Stock*, 130 USPQ 206, 208 (1961):

The mere fact that it is *possible* to find two isolated disclosures which might be combined in such a way to produce a new product does not necessarily render such production obvious unless the art also contains something to suggest the desirability of the proposed combination [emphasis added].

226 USPQ 870, 872 (Fed. Cir. 1985). Applicants' claims are *not* obvious in view of the above legal standard because the references, when taken together, fail to motivate or suggest the combination. As will be explained below, the cited art fails to provide motivation or suggestion of the present invention for several reasons.

It is impermissible within the framework of 35 U.S.C. §103 to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 USPQ 416 (Fed. Cir. 1986). Courts have long cautioned that consideration must be

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given "where the references diverge and teach away from the claimed invention". *Akzo N.V. v. International Trade Commission*, 1 USPQ 2d 1241, 1246 (Fed. Cir. 1986).

In the present instance, the Examiner improperly selected disclosures from the cited prior art without finding the motivation or suggestion necessary for one of ordinary skill in the art to combine them. As shown above, there is an assortment of prior art problems associated with various embodiments and configurations. First, Chan et al. disclose the incorporation of concentric neutral wires which are absent in the presently claimed invention. Second, Chan et al. disclose a multitude of variations of CN in combination with water swellable yarns. Similarly, Goehlich discloses a multitude of "structured materials" in several different variations and embodiments. From these multitude of variations, the Examiner picked and chose the adhesive from Goehlich and incorporated it in the cable of Chan and arrived at the presently claimed invention.

A person of ordinary skill in the art not only should have had some motivation to combine the prior art teaching but some motivation to combine prior art teaching in a particular manner claimed. *In re Kotzab*, 217 F.3rd 1365 (Fed. Cir. 2000)

Particular findings must be made as to the reason, the skilled artisan without the knowledge of the claimed invention would have selected these components for combination in a manner claimed (Emphasis added). *In re Ruffert*, 149 F.3rd 1350 (Fed. Cir. 1998). In other words, the Examiner must show some reasons that skilled artisan confronted with same problems as the invention and with no knowledge of claimed invention would select the elements from cited prior art reference, i.e., Chan et al. and Goehlich et al. for combination in the manner claimed.

In summary, none of the cited references supplies the requisite motivation or suggestion to prepare a cable of the presently claimed invention with three layers, one layer of which contains an adhesive.

Accordingly, Applicants request the withdrawal of the rejection of Claims 11-13, 16-18, 20 and 23-25 under 35 USC § 103 (a) as being unpatentable over Chan et al. (U.S. 5,486,648) in view of Goehlich (U.S. 6,784,371).

II. The Examiner has improperly used Applicants' own teaching to construct the obviousness rejection

Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes inventor disclosure as a blueprint for piecing together prior art to defeat patentability-the essence of hindsight. In re *Dembiczek*, 175 F.3d 994 (Fed. Cir. 1999).

There is no motivation or suggestion on the part of one of ordinary skill in the art at the time the invention was made to incorporate the adhesive of the secondary reference Goehlich, as well as the swellable material of Belli et al. in the cable of Chan *et al.* and achieve the cable of the presently claimed invention.

Applicants argue that there is no motivation to combine the teaching of Chan *et al.* with Goehlich and further in view of Belli and arrive at the present invention for the following reasons.

First, Chan *et al.* provides a cable comprising various embodiments of concentric neutral wires and water swellable polymers.

Second, Goehlich provides a multitude of “structured material” embodiments which include adhesives, tapes, or sealing materials.

Third, Belli *et al.* disclose the use of fillers. Note col. 6, lines 49-51. In contrast, the Applicants provide a dry, water resistant coaxial cable in the absence of fillers.

Fourth, Belli *et al.* disclose the disadvantages of using water swellable tapes or powders. In contrast, the cable of the present invention employs water swellable tapes.

Fifth, Belli *et al.* disclose that the presence of the water-swellable material dispersed into the expanded layer is able to effectively block moisture and/or water, thus avoiding the use of water-swellable tapes or of free water-swellable powders. In contrast, the Applicants’ dry, water resistant coaxial cable employs a second external conductor (15) made of metal, e.g., aluminum, copper or combinations thereof, contains the water protective element (16).

Finally, Belli *et al.* disclose a multitude of expanded layers for the electrical cable that is used for high voltage power transmission or distribution. Note cols. 5-6.

Thus, a person of ordinary skill in the art upon reading the teaching or disclosure of Chan *et al.*, Goehlich and Belli *et al.*, will have to determine which adhesive or CN embodiment, or expanded polymer or water swellable polymers to use. A person of ordinary skill in the art would *have to pick and choose* an adhesive, a CN embodiment or

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water swellable polymer from a multitude/plethora of selections and incorporate them in the cable of Chan et al. in order to achieve unexpected results.

It is submitted that there is no motivation or suggestion in the prior art to pick and choose a specific adhesive of Goehlich, a specific CN embodiment of Chan et al. or a specific water swellable polymers or expanded polymer of Belli, from a multitude of adhesive embodiments, CN embodiments or water swellable polymers or expanded polymer embodiments and particularly use them for the purpose of preparing the cables of the present invention. *In re Albrecht*, 435 F.2d 908, 911, 168 USPQ 293, 296 (CCPA 1971).

From the above, there is no motivation or suggestion on the part of one of ordinary skill in the art at the time the invention was made to incorporate the adhesive of Goehlich in the cable of Chan et al. and further in view of the plurality of layers of Belli and achieve the cable of the presently claimed invention. The *only* possible motivation would have been supplied by the Applicants' own specification, which of course would be proscribed as hindsight application of Applicants' own teachings.

It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This Court has previously stated that "[one] cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fritch*, 23 USPQ 2d 1780 (Fed. Cir. 1992).

The *only* teaching linking the adhesive of Goehlich *et al.* is found in the presently claimed invention. Moreover, even if the references did indicate that such a polymer might be tried, an *obvious-to-try* standard would be indicated, which is clearly *not* a sufficient basis for the rejection. The specified claimed modifications must be specifically motivated or suggested by the prior art.

Thus, the Examiner improperly used the Appellants' own teachings in an attempt to show obviousness of the present invention.

III. The Examiner has chosen to improperly ignore the Applicants' limitation in the presently claimed invention.

The present invention is directed to a dry, water resistant coaxial cable

comprising: a) a metal core conductor element; b) a dielectric element around the core conductor based on three layers, comprising: i) a first layer comprising a polymer mixed with an adhesive component and applied onto the core conductor as a uniform film; ii) a second layer comprising a cellular high expansion polymer on the first layer; and iii) optionally, a third layer comprising a reinforcement layer on the second layer; c) a second external conductor surrounding the dielectric element; d) a second conductor element on the second external conductor, comprising a water penetration protective element; and e) a protective cover surrounding the second conductor element.

Claim 22 recites that the second external conductor is formed in cylindrical pipe and longitudinally welded, extruded or the edges overlapped and the external conductor has a thickness of at least 0.34 mm and diameter on the pipe is $13.70\text{ mm}\pm0.10\text{ mm}$. Claim 23 recites that the water protection element comprises swellable tapes and can be placed helically, annularly or longitudinally on the conductor.

In effect, the Examiner has viewed the Appellant's own Disclosure as "prior art" under 35 USC § 103, which it is not. In order to ignore this limitation as immaterial, the Examiner must also improperly assume that the limitation to serves no useful purpose.

In *In re Kuehl*, 177 USPQ 250 (CCPA1973), the Court considered the "invention as a whole" to include the new zeolite as well as a process utilizing the new zeolite. The Board of Appeals which required the Appellant in *Kuehl* to show unexpected results in the use of the new zeolite, confused the "invention as a whole" with "the prior art". This requirement was considered by the Court as an improper requirement based upon the use of the hindsight.

Similarly, in the instant case, it is submitted that the Examiner has confused the terms "prior art" and "subject matter (invention) as a whole" as used in 35 U.S.C. § 103, specifically, to consider "second external conductor is formed in cylindrical pipe and longitudinally welded, extruded or the edges overlapped" or "water protection element material as applied helically, annularly or longitudinally on the conductor" as a non-critical limitation or as part of the "prior art" for the purposes of applying the statute. Accordingly, the Examiner's rejection incorrectly treats the claim limitations as part of

the prior art. The correct application of the test of §103 requires that the claims not be judged against any prior art other than the references cited and applied by the Examiner.

In *In re Pleuddemann*, 15 USPQ 2d 1738 (Fed Cir. 1990), a new class of coupling agents was discovered upon which the Patent Office had granted claims on articles made utilizing said coupling agents. Pleuddemann appealed claims directed to a use of new coupling agents for bonding or priming. The appealed claims recited the use of a novel and non-obvious class of organosilane compound. The Court again reversed the Board of Appeals on the basis that the Board had erroneously considered that in order for the process of use claims to be patentable, the result of the claimed process or method should be unpredictable in order to render the process non-obvious. The Court in *Pleuddemann* found the same flaw in the Board's reasoning as it found in *Kuehl* in that the Board presumed the Appellant's group of silane compounds to be "prior art". Similarly, the Examiner here has considered the Appellants quantitative method to be "prior art".

The Examiner has used the Appellants' specification teaching as though it were "prior art" to reject the Applicants' claims directed to a dry water resistant coaxial cable. The Federal Circuit held that the use of *per se* rules is improper in applying the test for obviousness under 35 U.S.C. §103. Rather, §103 requires a highly fact dependent analysis involving taking the "claimed subject matter as a whole" and comparing it to the prior art. To support a rejection under §103, the collective teachings of the prior art must have suggested to one of ordinary skill in the art that, at the time the invention was made, Applicants' claimed invention would have been obvious. It has been held that there simply was no suggestion or motivation in the prior art to obtain the unobvious products to which the claims were limited. Consequently, the rejections were overturned based upon §103.

In interpreting "a claimed invention as a whole", consideration of all the claim limitations is required. Thus, the language in a claim which recites "second external conductor is formed in cylindrical pipe and longitudinally welded, extruded or the edges overlapped" or "water protection element material as applied helically, annularly or longitudinally on the conductor "in an unobvious product must be treated as a material limitation and a motivation regarding this limitation must be present in the prior art for a §103 rejection to be sustained.

solved by a preferred embodiment of a cable according to the invention, which comprises a structured material between the inner cable sheath and the outer sheath arranged to allow that detectable substance, which occasionally could enter between the inner cable sheath and the outer sheath through a damaged section of the outer sheath, traveling along the perimeter of the inner cable sheath to reach the sensor but restrict traveling of said detectable substance in longitudinal direction of the cable to a short distance hereby covering a continuous part of the surface area of the inner cable sheath allowing contact friction between said inner cable sheath and said outer sheath at the not covered parts of said inner cable sheath. In case of a sheath damage which has effected at least the outer sheath and water ingress to that damage has taken place, the water also will enter into the interstice between the two sheaths.

Goehlich also provides a "structured material" which signifies a material which has a specific structure regarding the top view of the material which makes it capable to fulfill the above mentioned requirements regarding the detectable substance when build in a cable. Such "structured material" may include one type of material but also may include different types of material, which all together as fulfill said requirements. Furthermore, the construction of such "structured material" may be based on one continuous part as well as based on two or more parts, which for example may be connected, adherent, overlapped and/or contacted, respectively. The shape of the area of the inner cable sheath which is free of structured material can be of any kind which forms a border of a closed circumference. The structured material may include at least two stripe shaped sections with changing distance to each other side by side around the perimeter of the inner cable sheath and frequently connecting each other in short distances in longitudinal direction of the cable. The structured material may be swellable material, a self adhesive material, a sticky plastic, a tape and stripe shaped sputtered material which is longitudinally arranged, a tape and one stripe, sputtered adhesive and sealing material or any other multitude of materials as disclosed in cols.5-6.

Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes inventor disclosure as a blueprint for piecing together prior art to defeat patentability is the essence of hindsight. *In re Dembiczek*, 175 F.3d 994 (Fed. Cir. 1999).

The invention is directed to a manipulation of the incorporation of a water protection element material and second external conductor to produce the dry, water resistant cable of the presently claimed invention with unexpected properties. The issue is whether the prior art cited by the Examiner in no way suggests or teaches the modification. Clearly, in view of the improved cable, no such suggestion is made.

Response to Examiner's rejections

The Examiner stated the following rejection:

A. "The Examiner argued that Chan et al. discloses a "dry water resistant coaxial cable" which provides protection against migration of water. Chan discloses a cable comprising a metal core conductor (1), a dielectric element (2-4) around core (1) on the first layer and a third layer (4) comprising a reinforcement layer on second layer surrounding the dielectric element; a second conductor element (5a) on the second external conductor (6) comprising water penetration protection element (i.e. swellable yarn) and a protective element (7) surrounding the second conductor element..."

Chan doesn't necessarily disclose the first layer comprising an adhesive nor the adhesive being selected from the group consisting of vinyl adhesive, acrylic adhesive and combinations thereof (claim 13) nor the adhesive selected from the group consisting of ethylene acrylate acid, ethylene vinyl acid and combinations thereof (claim 20) nor the absorption capacity of more than 30 ml/g (claim 24).

Goehlich teaches a cable (Fig.1-4) comprising a cable core being surrounded by a plurality of insulating layers which overcome the shortcoming of the prior art cables by preventing water intrusion resulting onfrom damage outer sheath to travel longitudinally... Goehlich teaches that adhesive component may be selected from ethylene acrylate acid. (Col. 5, lines 8-20)... It would be obvious to one of ordinary skill in the art of cables at the time the invention was made to modify the insulation layers of Chan to comprise the adhesive component configuration as taught by Goehlich because Goehlich teaches that such configuration overcomes damage outersheath to travel ongitudinally thereby eliminating the possibility of internal components...."

As a preliminary matter, Applicants submit that the Examiner used the presently claimed invention as a blueprint for his Office Action rejection. There is no disclosure or suggestion in Chan et al. regarding a "dry, water resistant coaxial cable". There is no disclosure or suggestion in Chan et al. regarding a cable comprising three layers as

claimed in the present invention. There is no disclosure or suggestion in Chan et al. regarding a first and third layer comprising a reinforcement layer as claimed in the present invention.

In fact, Chan et al. discloses a cable comprising: cable (1); semiconductor shield (2); insulation (3); insulating shield (4); water swellable yarn (5); concentric neutral (CN) wires (6); and an encapsulating jacket (7). The water swellable yarn of Chan et al. is helically wound over (4), under CN wires which has a lay opposite to that of CN so it crisscrosses. Thus, disclosure from Chan et al. provide **no intention** for additional protection to be water resistant. If anything, Chan et al. teaches away from the claimed invention.

In contrast, the presently claimed invention is directed to a dry, water resistant coaxial cable comprising a metal core conductor element; a dielectric element around the core conductor based on three layers, comprising: a) a first layer comprising a polymer mixed with an adhesive component and applied onto the core conductor as a uniform film; b) a second layer comprising a cellular high expansion polymer and a swelling agent on the first layer; and c) optionally, a third layer comprising a mixed polymer reinforcement layer and adhesive on the second layer. Moreover, the cable further comprises a second external conductor surrounding the dielectric element; a second conductor element on the second external conductor, a water penetration protective element; and a protective cover surrounding the second conductor element. There is no disclosure or suggestion in the present invention regarding concentric neutral wires (CN) of Chan et al.

A primary object of Goehlich is to provide a cable which meets the requirements of detecting water in the interstice between outer sheath i.e., plastic) and inner sheath (i.e., metal or plastic). This object was solved by Goehlich by providing a cable comprising: a) a cable core, b) an inner cable sheath, c) an outer sheath and d) a sensor, which is extending along the cable for detecting a detectable substance inside the cable.

A secondary object of Goehlich is to provide a cable which meets the requirements of detecting water in the interstice between outer sheath i.e., plastic) and the inner sheath (i.e., metal or plastic) and at the same time blocking of substances like water not to enter the interstice of the two layers along the cable. This secondary object was

Applying the above caselaw to the present application, it is submitted that there is no evidence of suggestion, teaching or motivation to combine the teaching of Goehlich with the disclosure of Chan et al. and arrive at the presently claimed invention.

Goehlich's problems are directed to avoiding the presence of water. Neither Goehlich or Chan specifically address the types of or particular problems to which the claimed invention is confronted with, e.g., problems with presence of fillers which complicate the use of solvents when cleaning the cable. Thus, even if Goehlich or Chan were considered, they would not suggest the invention to one skilled in the art.

If the prior art does not appreciate the existence of the problem solved by the invention, the Applicants' recognition of the problem is in itself, **strong evidence of non-obviousness of the present invention.** *In re Nomiya*, 184 USPQ 607 (CCPA 1975).

Accordingly, Applicants request the withdrawal of the rejection of claims 11-13, 16-18, 20 and 23-25 as being unpatentable over Chan et al. in view of Goehlich.

B. The Examiner urged that "it would have been obvious to one having ordinary skill in the art of cables at the time the invention was made to modify the cable of modified Chan to comprise a swelling agent configuration as taught by Belli because Belli teaches that such configuration overcomes the shortcomings of prior art cables by effectively addressing both the problem of avoiding penetration and propagation of moisture and/or water inside the cable core, the problem of possible deformations or breakages of the metallic shield due to cable thermal cycles, while maintaining a proper electrical contact between the metal shield and the cable core....."

It is submitted that the Examiner's arguments and reliance upon Belli were misplaced because of the following reasons:

Belli discloses the use of fillers. Note col. 6, lines 49-51 as follows.

"...The polymer material, i.e., expanded layer can be mixed with the semiconductive filler, the water swellable material and other optional conventional additives according to methods known in the art(emphasis added)"

As disclosed in the specification, Applicants have developed a technique through the design of a dry coaxial cable *without the use of fillers*. Note page 2, last paragraph. Thus, Belli teaches away from the present invention. Accordingly, there is no motivation or suggestion to combine Belli with Chan and arrive at the presently claimed invention.

Moreover, it is impermissible to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 U.S.P.Q. 416 (Fed. Cir. 1986).

Applying the case law to the present invention, it is submitted that the object of the present invention is to prepare a dry water resistant coaxial cable without the use of fillers. Moreover, the presently claimed invention has a different configuration as compared to configuration of Belli et al.

This is a classic situation in which no motivation or suggestion is found in the prior art. See, for example, *In re Rinehart*, 189 USPQ 143, 149 (CCPA 1976) where the CCPA clarified that it was improper to maintain an obviousness rejection where "the problem is nowhere alluded to in either . . . [references] and of course no suggestion of a solution appears in either reference." In the present case, as in *Rinehart*, it is improper, and indeed illogical, to find a motivation in the prior art to combine elements to solve a problem when the problem being solved was unknown.

Where the prior art does not appreciate the existence of the problem solved by the invention, the Applicant's recognition of the problem is, in itself, strong evidence of the non-obviousness of the invention. *In re Sponnable*, 160 USPQ 237, 243 (CCPA 1969).

The Applicants urge that the Examiner as a matter of law erred by combining prior art references based on incorrect teaching-suggestion motivation test.

There must be some specific understanding or principle within the knowledge of skilled artisan that would have motivated one with no knowledge of the invention to make the combination in the manner claimed. *In re Kotzab*, 217 F.3rd at 1371.

Based on the nature of the problem to be solved, express teachings of prior art or knowledge of one of ordinary skill in the art, the Examiner is required to make specific finding as to whether there was a suggestion or motivation to combine teachings of Goehlich with Chan et al and further in view of Belli et al. in a particular manner as claimed in the present invention. The Examiner has not shown such specific finding as to suggestion or motivation from the prior art.

It is submitted that the nature of the problem to be solved may under appropriate circumstances provide suggestion or motivation to combine prior art. However, the test

requires nature of the problem to be solved be such that it would have led a person of ordinary skilled in the art to combine prior art teachings in a particular manner claimed.

See *In re Rouffert*, 149 F.3rd 1357.

In this case, Goehlich does not address the same problem. The objective of Goehlich is to design a cable which can detect water. It has a simple cable combination comprising a cable core, an inner sheath, a sensor, a structured material and an outer sheath. The Examiner selected an adhesive from a multitude of “structured material” embodiments.

The Examiner's reliance on the problem associated with Belli fails to provide the sufficient motivation to combine the disclosure of Belli with Chan et al. Belli discloses the use of fillers. Moreover, Belli discloses a multitude of expanded polymers and water swellable polymers. Belli does not address the problem to be solved by the present invention. Rather, it suffers from the problem. The Examiner did not explain how suffering from the problem addressed by Belli would have specifically motivated one of ordinary skill in the art to combine the water swellable polymers to the multitude of CN embodiments of Chan et al. and arrive at the present invention.

In other words, solving the water penetration problem of Belli is a different task where it uses an expanded polymer comprising the water swellable polymer as compared to the present invention. What is more, the present invention does not relate to the use of expanded polymer to comprise the water protection element. Rather, it uses a second external conductor made of metal. The present invention is directed to a dry water resistant cable which comprises different layers or elements arranged in a configuration that performs different functions and prevent water penetration. Therefore, Belli does not address the problem of the present invention.

Applicants submit that there is no motivation or suggestion that one of ordinary skill in the art would pick and choose a certain embodiment, from a plethora of ingredients/embodiments or polymers, incorporate these teaching in the presently claimed invention and achieve the desired results as claimed in the present invention.

Accordingly, Applicants request the withdrawal of the rejection of the Claims 14-15, 19, 21-22 and 26-27 are rejected under 35 USC§ 103 (a) as being unpatentable over Chan et al. (U.S. 5,486,648) in view of Goehlich (U.S. 6,784,371) and further in view of

Martinez et al.
10/613,433
Response to OA dated 5/19/05
Belli (U.S.6,455,769).

In view of the above remarks, it is respectfully submitted that the claims are in condition for allowance. In the event that there are any problems which can be expedited by telephone conference, the Examiner is invited to telephone the Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,
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